

Carbaryl Summary

Uses

- Carbaryl (1-naphthyl methylcarbamate) is a widely used broad-spectrum insecticide. Approximately 3.9 million pounds (59 percent) of carbaryl is used in agriculture, and approximately 2.2 million pounds (34 percent) of carbaryl is used by homeowners in residential settings. The remaining uses (7 percent) are in the nursery, landscape and golf course industries.
- Agricultural uses include fruit and nut trees, many types of fruits and vegetables, and grain crops. Homeowners use carbaryl for lawncare, gardening, and petcare. Other uses for carbaryl include greenhouses, sod farms, mosquito adulticide use, and a special local need use of carbaryl on oyster beds in Washington State.

Health Effects

- Carbaryl can cause cholinesterase inhibition in humans; that is, it can overstimulate the nervous system causing nausea, dizziness, confusion, and at high exposures, respiratory paralysis, and death.
- Carbaryl has been classified as “likely to be carcinogenic to humans” based on vascular tumors in mice.

Risks

Dietary Risks from Food

- Acute dietary risk estimates with Carbamate Market Basket Survey data are not of concern for the entire U.S. population, including infants and children. Chronic (cancer and noncancer) dietary risks are also not of concern.

Dietary Risks from Drinking Water

- Carbaryl is moderately mobile in the environment, and is non-persistent.
- Acute surface water risks, based on high-end estimates from computer modeling, are of concern for all populations when combined with food exposures. Chronic (noncancer and cancer) risks from surface water are low and not of concern.
- Groundwater risks, both acute and chronic (noncancer and cancer), are low and not of concern when combined with food exposures. Groundwater concentrations are also based on modeling predictions.

Residential risks

- For exposures to homeowner handlers, 8 out of 17 scenarios resulted in noncancer risks of concern. For carbaryl, dermal exposures generally determined the risk levels. Cancer risks for all 17 scenarios were not of concern.

- For postapplication exposure to homeowners, only one scenario (lawncare) resulted in noncancer risks of concern for adults. For children 10-12, there are no risks of concern; however, postapplication exposures are of concern for toddlers for pet treatment and lawncare. Cancer postapplication risks are low for all scenarios and are not of concern.

Aggregating Dietary and Residential Risk

- Based on selected residential scenarios that are not of concern alone, only one scenario had aggregate risks of concern when combined with dietary (food and drinking water) exposures.

Occupational Exposures

- Out of 128 short- and intermediate-term handler exposure scenario combinations, only 18 had noncancer risks of concern, even when considering the highest level of personal protection practicable (including engineering controls). Out of 5 long-term exposure scenarios, 2 had noncancer risks of concern.
- For occupational handler cancer risks, 8 of the 128 handler exposure scenario combinations resulted in risks of concern to private growers. For commercial applicators, 21 scenarios had cancer risks of concern.
- Occupational postapplication risks (noncancer and cancer) are of concern at the current 12 hour REI for most scenarios.

Ecological Risks

- For nongranular carbaryl uses, acute risk to birds is low, but chronic risk to birds is of concern. There is concern for both acute and chronic risk to mammals.
- For all granular uses, there is concern for acute risk to birds and small mammals. There is no concern for acute risk to larger mammals.
- There is concern for acute risk to freshwater fish and all aquatic invertebrates, and concern for chronic risk to freshwater aquatic invertebrates. There is no concern for chronic risk to freshwater fish.

How the Risk Picture May Change

The registrant is completing a chemical-specific biomonitoring study which will further quantify and characterize occupational and residential use risks, and a targeted surface water monitoring study to further characterize the presence of carbaryl in drinking water.